भारतीय मानक **IS 18149 : 2023**

Indian Standard

खतरनाक सामग्रियों का परिवहन — दिशानिर्देश

Transportation of Dangerous Goods — Guidelines

ICS 13.300, 55.020, 03.220

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Transport Services Sectional Committee, SSD 01

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Transport Services Sectional Committee had been approved by the Service Sector Division Council.

Dangerous goods are substances and articles that have explosive, flammable, toxic, infectious or corrosive properties and pose a risk to public safety, property and the environment. The transportation of these goods involves the implementation of adequate measures to ensure their transit in total security and safety. Transportation may be by land, sea, waterways, rail or even by air.

The sensitivity and risk factors involved in transporting hazardous goods required specific precautions to be taken. These include meticulous packaging and conditioning, specific handling operations during transportation and training and development for persons engaged in transportation and handling of this category of goods.

The transportation of dangerous goods is controlled and governed by various regulatory regimes, operating at both the national and international levels. While formulating this standard, assistance has been taken from Central Motor Vehicles Rules, 1989 (CMVR) and International documents including UN Model Regulations - Recommendations for Transportation of Dangerous Goods (twenty second edition). The UN Model Regulations are given legal entity by the provision of a series of international modal agreements and national legislation for the transport of dangerous goods.

These international agreements include:

a) the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR);
b) the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID);
c) the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI); and
d) the International Maritime Dangerous Goods Code (IMDG).

This standard is formulated to provide guidelines for all the stakeholders including good vehicle owners/transport agencies, contractors, consignors, consignees, operators and drivers carrying dangerous goods/substances for the safe transportation of dangerous goods. The standard broadly covers guidelines on classification, packaging, labelling and marking, transportation, documentation, role of stakeholders, training, emergency action and provisions for segregation.

The composition of the committee, responsible for the formulation of this standard is listed in Annex E.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TRANSPORTATION OF DANGEROUS GOODS — GUIDELINES

1 SCOPE

This standard provides guidelines on packaging, labeling, handling and transport operations for safe transportation of dangerous goods based on their classification which include explosives, gases, flammable liquids, flammable solids, oxidizing substances and organic peroxides, poisonous and infectious substances, radioactive substances, corrosive substances and other miscellaneous dangerous substances, in order to prevent harm to human, animals, property and the environment.

NOTE — These guidelines are not applicable for the dangerous goods forbidden for transportation by law.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
IS 1446 : 2002	Classification of dangerous goods
IS 11466 (Part 2) : 1985	Guidelines for packing, stowage and securing of cargo inside the freight containers: Part 2 dangerous goods
IS 16833 : 2018	Automotive tracking device (ATD) and integrated systems

3 TERMS AND DEFINITIONS

For the purpose of this standard, the following definitions should apply.

3.1 Bulk Container — A containment system (including any liner or coating) intended for the transport of solid substances which are in direct contact with the containment system. Packaging, intermediate bulk containers (IBCs), large packaging and portable tanks are not included.

NOTE — A bulk container is:

a) of a permanent character and accordingly strong enough to be suitable for repeated use;
b) specially designed to facilitate the transport of goods by one or more means of transport without intermediate reloading;
c) fitted with devices permitting its ready handling; and
d) of a capacity of not less than 1.0 m^3.

3.2 Cargo Transport Unit — A road transport tank or freight vehicle, a railway transport tank or freight wagon, a multimodal freight container or portable tank, or a multiple-element gas container (MEGC).

3.3 Carrier — Any person, organization or government undertaking the transport of dangerous goods by any means of transport.

3.4 Classification — Categorization of dangerous goods in either of the hazard class or its division.

3.5 Combination Packaging — A combination of packaging for transport purposes, consisting of one or more inner packaging secured in an outer packaging.

3.6 Composite Packaging — A packaging consisting of an outer packaging and an inner receptacle so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, transported and emptied as such.

3.7 Competent Authority — Any person or organization that has the legally delegated or invested authority, capacity, or power to perform a designated function.

3.8 Consignee — Any person, organization or government which is entitled to take delivery of a consignment.

3.9 Consignment — Any package or packages, or load of dangerous substances (solid, liquid or gas) or goods, presented by a consignor for transportation.

3.10 Consignor — Any person, organization or government who prepares a consignment for transport.

3.11 Corrosive Substance — Substances which by chemical action will cause severe damage when in contact with living tissue or in the case of leakage will materially damage or even destroy other goods or the means of transport, they may also cause other hazards.

3.12 Crate — An outer packaging with incomplete surfaces.

3.13 Cylinder — A transportable pressure receptacle of a water capacity not exceeding 150 litres.

3.14 Dangerous Goods — Articles or substances which are capable of posing a hazard to health,

safety, property or the environment and which are classified according to the details given in Table 1.

NOTE — The material includes article, substance, mixtures and preparations. The classification of dangerous goods is covered under **5.1**.

3.15 Drum — A flat-ended or convex-ended cylindrical packaging made of metal, fibreboard, plastics, plywood or other suitable materials. This also includes packaging of other shapes, for example round taper-necked packaging, or pail-shaped packaging.

NOTE — Wooden barrels or jerricans are not covered by this definition.

3.16 Explosive Article — An article containing one or more explosive substances.

3.17 Explosive Substance — A solid or liquid substance (or a mixture of substances) which in itself is capable of producing gas by chemical reaction at such a temperature, pressure and at such a speed as to cause damage to the surroundings.

3.18 Filler — The participant (individual or business) who is responsible for filling tanks or containers (for carriage in bulk) with dangerous goods prior to transportation.

3.19 Flammable Gas — A gas having flammable range with air at 20 °C and standard pressure of 101.3 kPa.

3.20 Flammable Liquids — Liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances otherwise classified on account of their dangerous characteristics) which gives off a flammable vapour at temperatures of not more than 60.5 °C.

3.21 Flammable Solids — Solids which under conditions encountered in transport, are readily combustible or may cause or contribute to fire through friction.

3.22 Freight Container — Article of transport equipment which is:

a) of a permanent character and accordingly strong enough to be suitable for repeated use;
b) specially designed to facilitate the carriage of goods by one or more modes of transport, without intermediate reloading;
c) fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another;
d) so designed as to be easy to fill and empty; and
e) having an internal volume of at least 1 m³.

3.23 Freight Forwarder — A person or organization who offers the service of arranging the transport of cargo.

3.24 Gas — A gas is a substance which:

a) at 50 °C has a vapour pressure greater than 300 kPa; or
b) is completely gaseous at 20 °C at a standard pressure of 101.3 kPa.

NOTE — For the transport condition, a gas is described according to its physical state as follows:

a) *Compressed gas* — A gas (other than in solution) which when packaged under pressure for transport is entirely gaseous at 20 °C;
b) *Liquefied gas* — A gas which when packaged for transport is partially liquid at 20 °C;
c) *Refrigerated liquefied gas* — A gas which is liquefied by refrigeration and maintained at or near its boiling point at atmospheric pressure;
d) *Gas in Solution* — Compressed gas which when packaged for transport is dissolved in a solvent: and
e) *Adsorbed gas* — A gas which when packaged for transport is adsorbed onto a solid porous material resulting in an internal receptacle pressure of less than 101.3 kPa at 20 °C and less than 300 kPa at 50 °C.

3.25 Infectious Substances — Substances known or reasonably expected to contain pathogens.

NOTE — Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans.

3.26 Inner Packaging — A packaging for which an outer packaging is required for transport.

3.27 Inner Receptacle — A receptacle which requires an outer packaging in order to perform its containment function.

3.28 Intermediate Bulk Container (IBC) — Any rigid or flexible portable packaging that:

a) has a capacity of:
   1) not more than 3.0 m³ for solids and liquids of packing groups II and III;
   2) not more than 1.5 m³ for solids of packing group I when packed in flexible, rigid plastics, composite, fiberboard and wooden IBCs;
   3) not more than 3.0 m³ for solids of packing group I when packed in metal IBCs; and
   4) not more than 3.0 m³ for radioactive material of Class 7;

b) is designed for mechanical handling; and

c) is resistant to the stresses produced in handling and transport, as determined by the tests.

3.29 Intermediate Packaging — A packaging placed between inner packaging, or articles, and an outer packaging.

3.30 Large Packaging — A packaging consisting of an outer packaging which contains articles or inner packaging and which:

a) is designed for mechanical handling; and

b) exceeds 400 kg net mass or 0.45 m^3 capacity but has a volume of not more than 3 m^3.

3.31 Large Salvage Packaging — A special packaging which is designed for mechanical handling and exceeds 400 kg net mass or 0.45 m^3 capacity.

NOTE — This special packaging has a volume of not more than 3 m^3; into which damaged, defective, leaking or non-conforming dangerous goods packages, or dangerous goods that have spilled or leaked are placed for purposes of transport for recovery or disposal.

3.32 Loader — The participant (individual or business) who is responsible for loading dangerous goods onto a vehicle prior to transportation.

3.33 Organic Peroxides — Substance which contain the bivalent O-O structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. This also includes organic peroxides formulations (mixtures).

NOTE — Organic peroxides are thermally unstable substances, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties:

1 Be liable to explosive decomposition;
2 Burn rapidly;
3 Be sensitive to impact or friction;
4 React dangerously with other substances; and
5 Cause damage to the eyes.

3.34 Outer Packaging — The outer protection of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packaging.

3.35 Overpack — An enclosure used by a single consignor to contain one or more packages and to form one unit for convenience of handling and stowage during transport.

3.36 Oxidizing Substances — Substance which, while in themselves not necessarily combustible, may generally cause, or contribute to the combustion of other material by yielding oxygen.

3.37 Package — The complete product of the packing operation, consisting of the packaging and its contents prepared for transport.

3.38 Packaging — One or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions.

3.39 Portable Tank — Tanks that are used for the transportation and storage of dangerous liquids such as chemicals, oil and gas and drilling fluids, waste materials and aviation fuel.

NOTE — These tanks are inside a frame, protecting it from damage during shipping and handling.

3.40 Radioactive Material — Any material containing radio nuclide where both the activity concentration and the total activity in the consignment exceed the values specified, depending on the type of material, by the Atomic Energy Commission of India.

3.41 Receptacle — A containment vessel for receiving and holding substances or articles, including any means of closing.

3.42 Salvage Packaging — A special packaging into which damaged, defective, leaking or non-conforming dangerous goods packages, or dangerous goods that have spilled or leaked, are placed for purposes of transport for recovery or disposal.

3.43 Security — Measures or precautions to be taken to minimize theft or misuse of dangerous goods that may endanger persons or property.

3.44 Shipment — The specific movement of a consignment from origin to destination.

3.45 Tank — A portable tank including a tank container, a road tank-vehicle, a rail tank-wagon or a receptacle to contain solids, liquids, or gases, having a capacity of not less than 0.45 m^3 when used for the transport of gases.

3.46 Toxic Substances — Substances liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact.

3.47 Unloader — The participant (individual or business) who is responsible for the removal of dangerous goods from a vehicle, or the unloading or discharge of dangerous goods from a tank, container or vehicle.

4 STATUTORY AND REGULATORY REQUIREMENTS

The stakeholders involved in transportation of dangerous goods including consignor, consignee, carrier agency shall ensure compliance to statutory and regulatory requirements and guidelines applicable at National and International levels including Annex A.

5 CLASSIFICATION — CLASSES, DIVISIONS AND PACKING GROUPS

5.1 Substances (including mixtures and solutions) and articles subject to this standard shall be assigned to one of the nine classes according to the hazard or the most predominant of the hazards they present. Some of the classes are further subdivided into divisions. The classes and their divisions are given in Table 1.

Table 1 Classification of Dangerous Goods

(*Clause* 5.1)

Sl No.	Class	Division	Substance
(1)	(2)	(3)	(4)
i)	Class 1 - Explosives	1.1	Substances and articles which have a mass explosion hazard
		1.2	Substances and articles which have a projection hazard but not a mass explosion hazard
		1.3	Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard
		1.4	Substances and articles which present no significant hazard
		1.5	Very insensitive substances which have a mass explosion hazard
		1.6	Extremely insensitive articles which do not have a mass explosion hazard
ii)	Class 2 - Gases, compressed, liquefied, dissolved under pressure or deeply refrigerated	2.1	Flammable gases
		2.2	Non-flammable, non-toxic gases
		2.3	Toxic gases
iii)	Class 3 - Flammable liquids	-	Flammable liquids
iv)	Class 4 - Flammable solids; substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases	4.1	Flammable solids, self-reactive substances, solid desensitized explosives and polymerizing substances
		4.2	Substances liable to spontaneous combustion
		4.3	Substances which in contact with water emit flammable gases
v)	Class 5 - Oxidizing substances and organic peroxides	5.1	Oxidizing substances
		5.2	Organic peroxides
vi)	Class 6 - Toxic and infectious substances	6.1	Toxic substances
		6.2	Infectious substances
vii)	Class 7 - Radioactive material	-	-
viii)	Class 8 - Corrosive substances	-	-
ix)	Class 9 - Miscellaneous dangerous substances and articles, including environmentally hazardous substances	-	-

NOTES

1 The numerical order of the classes and divisions is not that of the degree of danger.

2 Refer IS 1446 for further detailed classification of dangerous goods.

3 The Dangerous Goods list does not include goods which are so dangerous that their transport, except with special authorization, is prohibited. Also, such goods are not listed because the transport of some goods may be prohibited for some modes of transport and allowed in others and, in addition, because it would be impossible to draw up an exhaustive list.

4 For precedence of hazard characteristics, refer **2.0.3** of UN Model Regulations on dangerous goods.

5.2 For packing purposes, substances should be assigned to the following three packing groups in accordance with the degree of danger they present:

a) *Packing Group I* – Substances presenting high danger;

b) *Packing Group II* – Substances presenting medium danger; and

c) *Packing Group III* – Substances presenting low danger.

NOTE — For further details on packing group, Chapter **3.2** of UN Model Regulations may be referred.

5.3 Placards and UN Numbers

5.3.1 Each dangerous goods class should be represented by a placard, that is a distinctive and specific class label in the shape of a diamond.

5.3.2 Depending on its properties, each type of dangerous goods shall be assigned a number known as its UN number. The UN number should be available on the label, transport document and safety data sheet.

6 PACKING AND TANK PROVISIONS

6.1 Dangerous goods should be packed in good quality packaging, including IBCs and large packaging, which should be strong enough to withstand the shocks encountered during loadings, unloading and transportation, including transshipment between cargo transport units and warehouses.

6.2 For the construction and testing of packaging, intermediate bulk containers (IBCs), large packaging, portable tanks, multiple-element gas containers (MEGCS) and bulk containers, the compliance to Chapter **6** of UN Model Regulations on the transport of dangerous goods should be ensured.

6.3 In order to prevent any loss of contents or damage to dangerous goods during transportation due to vibration or changes in environmental conditions, the packaging, including IBCs and large packaging, should be constructed in accordance with the information provided by the manufacturer.

6.4 No dangerous residue should adhere to the outside of packages, IBCs and large packaging during transport.

6.5 The packaging or parts of packaging, including IBCs and large packaging, which are in direct contact with dangerous goods should not:

a) be significantly weakened and affected by the dangerous goods;

b) cause a dangerous effect, for example catalyzing a reaction or reacting with the dangerous goods; and

c) allow permeation of the dangerous goods that may pose a danger under normal conditions of transport.

6.6 When filling packaging, including IBCs and large packaging, with liquids, sufficient outage should be left to ensure that neither leakage nor permanent distortion of the packaging occurs as a result of an expansion of the liquid caused by temperature–fluctuations likely to occur during transport. Unless specific requirements are prescribed, liquid should not be completely filled in packaging at a temperature of 55 °C. However, sufficient outage should be left in an IBC to ensure that at the mean bulk temperature of 50 °C, it is not filled to more than 98 percent of its water capacity.

6.7 For air transport, packaging intended to contain liquids should also be capable of withstanding a pressure differential without leakage as specified in the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI) and *The Aircraft (Carriage of Dangerous Goods) Rules*, 2003 of Director General of Civil Aviation.

6.8 Inner packaging inside an outer packaging should be done in such a way that, under normal conditions of transport, it should not break, puncture or leak contents into the outer packaging. Inner packaging containing liquids should be packed with their closures facing upward. Inner packaging that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials, etc., should be secured in outer packaging with suitable cushioning material. Any leakage of the contents should not substantially impair the protective properties of the cushioning material or of the outer packaging.

6.9 Where an outer packaging of a combination packaging or a large packaging is successfully tested with different types of inner packaging, a variety of such different inner packaging may also be assembled, if appropriate, in this outer packaging or large packaging. In addition, and to ensure that an equivalent level of performance is maintained, the following variations in inner packaging should be allowed without further testing of the package:

a) Inner packaging of equivalent or smaller size may be used provided:

1) the inner packaging is of similar design to the tested inner packaging (for example shape-round, rectangular, etc);

2) the construction of material of the inner packaging (glass, plastics, metal, etc) should resist impact and stacking forces equal to or greater than that of the originally tested inner packaging;
3) the inner packaging has the same or smaller openings and the closure is of similar design (for example screw cap, friction lid, etc);
4) sufficient additional cushioning material should be used to take up void spaces and to prevent significant movement of the inner packaging; and
5) inner packaging should be oriented within the outer packaging in the same manner as in the tested package.

b) A lesser number of the tested inner packaging, or of the alternative types of inner packaging identified in **6.9 a)**, should be used provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the inner packaging.

6.10 Use of supplementary packaging within an outer packaging (for example an intermediate packaging or a receptacle inside a required inner packaging) additional to what is required by the packing instructions may be permitted provided all relevant requirements are met, and if appropriate, suitable cushioning may be used to prevent movement within the packaging.

6.11 Dangerous goods should not be packed together in the same outer packaging or in large packaging, if they react dangerously with each other and cause:

a) combustion and/or evolution of considerable heat;
b) evolution of flammable, toxic or asphyxiant gases;
c) the formation of corrosive substances; and
d) the formation of unstable substances.

6.12 The consignor should ensure that the closures should be of appropriate design to prevent loss of liquid during the transport. The packaging containing wetted or diluted substances should be such that the percentage of liquid (water, solvent or phlegmatizer) should not fall below the prescribed limits given by the manufacturer or any other relevant concerned authority during the transport.

6.13 Where two or more closure systems are fitted in series on an IBC then the closure system nearest to the substance being carried should be closed first.

6.14 Where pressure may develop in a package by the emission of gas from the contents (as a result of temperature increase or other causes), the packaging or IBC should be fitted with a vent provided that the gas emitted should not cause danger on account of its toxicity, its flammability or the quantity released.

6.15 Liquids should only be filled into inner packaging which have an appropriate resistance to internal pressure that may be developed under normal conditions of transport.

6.16 Venting of the package should not be permitted if the dangerous goods have to be trans-shipped for air transport.

6.17 Packaging, including IBCs, used for solids which may become liquid at temperatures likely to be encountered during transport should also be capable of containing the substance in the liquid state.

6.18 Packaging, including IBCs, used for powdery or granular substances should be sift proof or should be provided with a liner.

6.19 For plastic drums and jerrycans/carboys, rigid plastics IBCs and composite IBCs with plastics inner receptacles should be used, unless otherwise approved by the competent authority. The period of use permitted for the transport of dangerous substances should be five years from the date of manufacture of the receptacles, except where a shorter period of use is prescribed because of the nature of the substance to be transported.

NOTE — For composite IBCs the period of use refers to the date of manufacture of the inner receptacle.

6.20 For explosives, self-reactive substances and organic peroxides, the packaging, including IBCs and large packaging, used for goods of Class 1, self-reactive substances of Division 4.1 and organic peroxides of Division 5.2 should comply with the provisions for the medium danger group (Packing Group II).

6.21 Damaged, defective, leaking or non-conforming packages of dangerous goods that have spilled or leaked should be transported in salvage packaging and large salvage packaging.

6.22 Appropriate measures should be taken to prevent excessive movement of the damaged or leaking packages within a salvage packaging. When the salvage packaging contains liquids, sufficient inert absorbent material should be added to eliminate the presence of free liquid.

6.23 Appropriate measures should be taken to ensure that there is no dangerous build-up of pressure.

NOTES
1 Refer IS 11466 (Part 2) for additional guidelines for packing, stowage and securing cargo inside freight containers.
2 In addition to above, refer UN Model Regulations - Recommendations on Transport of Dangerous Goods for packaging instructions.

6.24 For the purposes of the transport of:

a) substances of Class 1 and Classes 3 to 9, a multimodal portable tank should be used which includes a shell fitted with service equipment and structural equipment necessary for the transport of dangerous substances;

b) non-refrigerated, liquefied gases of Class 2, a multimodal tank having a capacity of more than 450 litres should be used which includes a shell fitted with service equipment and structural equipment necessary for the transport of gases; and

c) refrigerated liquefied gases, a thermally insulated tank should be used having a capacity of more than 450 litres fitted with service equipment and structural equipment necessary for the transport of refrigerated liquefied gases.

NOTE — The portable tank should be capable of being loaded and discharged without the need of removal of its structural equipment. It should possess stabilizing members external to the shell, and should be capable of being lifted when full. It should be designed primarily to be loaded on to a vehicle or vessel and is equipped with skids, mountings or accessories to facilitate mechanical handling.

7 LABELLING AND MARKING

7.1 Labeling and Marking on Packages

7.1.1 Unless provided in this standard, the proper shipping name for the dangerous goods and the corresponding UN number preceded by the letters 'UN', should be displayed on each package. The UN number and the letters 'UN' should be at least 12 mm high, except for packages of 30 litres capacity or less or of 30 kg maximum net mass and for cylinders of 60 litres water capacity or less when they should be at least 6 mm in height and except for packages of 5 litres capacity or less or of 5 kg maximum net mass when they should be of an appropriate size. In the case of unpackaged articles, the mark should be displayed on the article, on its cradle or on its handling, storage or launching device.

7.1.2 Salvage packaging including large salvage packaging and salvage pressure receptacles should additionally be marked with the word 'SALVAGE'. The lettering of the 'SALVAGE' mark should be at least 12 mm high.

7.1.3 Intermediate bulk containers of more than 450 litres capacity and large packaging should be marked on two opposing sides.

7.1.4 The markings as mentioned in **7.1.1** should be:

a) in English and readily visible and legible;

b) able to withstand open weather exposure without a substantial reduction in effectiveness;

c) displayed on a background of contrasting colour on the external surface of the package; and

d) be located away from any other marking (such as advertising) that could substantially reduce their effectiveness and visibility.

7.1.5 The label on the packages should contain the following information:

a) The trade name as well as technical /chemical name;

b) The name and the address, including telephone number of the manufacturer, the importer or the distributor;

c) The chemical name of the substance (in the case of a preparation, the chemical names of the hazardous components);

d) Primary and subsidiary class label;

e) Risk phrases (R-phrases);

f) Safety phrases (S-phrases); and

g) The quantity of the contents of the package or container.

NOTE — Refer Annex B for the diagrammatic representation of the labels.

7.1.6 For receptacles of capacity 20 litres or more, a diamond shaped label of at least 100 mm x 100 mm in the form of a square set at an angle of 45 and the minimum width of the line inside the edge forming the diamond should be 2 mm denoting primary transport hazard class assigned should be affixed on the receptacles. In the case of being a secondary hazard, then the transport hazard diamond label should be affixed adjacent to the primary hazard, placard based on the markings as appearing on the packaging in visual proximity to the primary hazard label. However, for receptacles with capacity less than 20 litres, a smaller but clearly legible label should be affixed.

7.1.7 *Special Marking Provisions for Radioactive Material*

Each package should be legibly and durably marked on the outside of the packaging with an identification of either the consignor or consignee,

or both. Each over pack should be legibly and durably marked on the outside of the over pack with an identification of either the consignor or consignee, or both unless these marks of all packages within the over pack are clearly visible. Each package of gross mass exceeding 50 kg should have its permissible gross mass legibly and durably marked on the outside of the packaging.

7.1.8 *Special Marking Provisions for Environmentally Hazardous Substances*

Unless otherwise specified in this standard, packages containing environmentally hazardous substances should be durably marked with the environmentally hazardous substance mark. The environmentally hazardous substance mark should be located adjacent to the markings given in **7.1.1** and should meet the requirements given in **7.1.3** and **7.1.4**. The environmentally hazardous substance mark should be as shown in Fig. 1.

FIG. 1 ENVIRONMENTALLY HAZARDOUS SUBSTANCE MARK

7.2 Placarding of Cargo Transport Units and Bulk Containers

7.2.1 In order to provide a warning that the contents of the unit are dangerous goods and present hazards, placards should be affixed to the exterior surface of cargo transport units and bulk containers.

7.2.2 The followings should be ensured while affixing placards:

a) Placards should correspond to the primary hazard of the goods contained in the cargo transport unit and bulk container;
b) Placards should be displayed on a background of contrasting colour, or should have either a dotted or solid outer boundary line;
c) All placards should withstand the rigors of the journey;
d) The size of diamond placard should be at least 250 mm x 250 mm denoting the assigned primary transport hazard class. The line inside the edge should be parallel and 12.5 mm (except for Class 7) from the outside of that line to the edge of the placard. For Class 7, the line inside the edge should be parallel and 5 mm from the outside of that line to the edge of the placard. *see* Fig. 2 and Fig. 3;
e) In case of a secondary hazard, the transport hazard diamond placard should be affixed adjacent to and in visual proximity to the primary hazard placard;
f) In the case of a vehicle without sides, the placards may be affixed directly on the cargo-carrying unit provided that they are readily visible;
g) For physically large tanks or freight containers, the placards on the tanks or freight containers should be sufficed; and
h) In the case of vehicles having insufficient area to affix larger placards, the dimensions of the placard as described in Fig. 2 and Fig. 3 may be reduced to 100 mm. Any placards which do not relate to the contents should be removed.

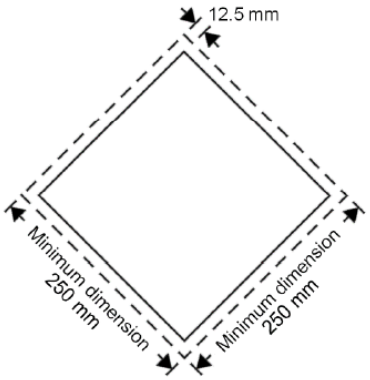

FIG. 2 PLACARD (EXCEPT FOR CLASS 7)

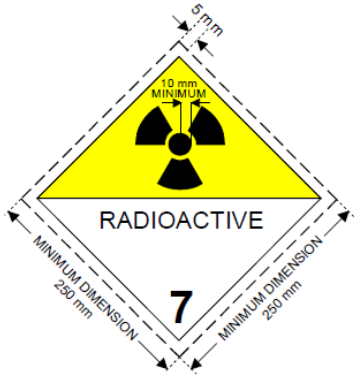

FIG. 3 PLACARD FOR RADIOACTIVE MATERIAL OF CLASS 7

7.3 Markings of Cargo Transport Units and Bulk Containers

7.3.1 *Proper Shipping Name*

The proper shipping name of the contents of consignment of dangerous goods should be:

a) durably marked on at least both sides of tank cargo transport units and bulk containers containing dangerous goods; and

b) displayed in characters not less than 65 mm high and should be of contrasting colour with the background.

7.3.2 *Display of UN Numbers*

7.3.2.1 UN Number should be displayed on consignments of:

a) solids, liquids or gases transported in tank cargo transport units, including each compartment of a multi-compartment tank cargo transport unit;

b) packaged dangerous goods of a single commodity which constitute a full load for the cargo transport unit; and

c) solid dangerous goods in bulk containers.

7.3.2.2 The UN Number for the goods should be displayed in black digits not less than 65 mm high, either:

a) against a white background in the area below the pictorial symbol and above the class number and the compatibility group letter in a manner that does not obscure or detract from the other required label elements;

b) on an orange rectangular panel not less than 120 mm high and 300 mm wide, with a 10 mm black border, to be placed immediately adjacent to each placard. *See* Fig. 4; and

c) for portable tanks with a capacity of not more than 3 000 litres and with an available surface area insufficient to affix the prescribed placards, the UN number may be displayed on an orange rectangular panel of appropriately reduced size on the external surface of the tank in characters not less than 25 mm high.

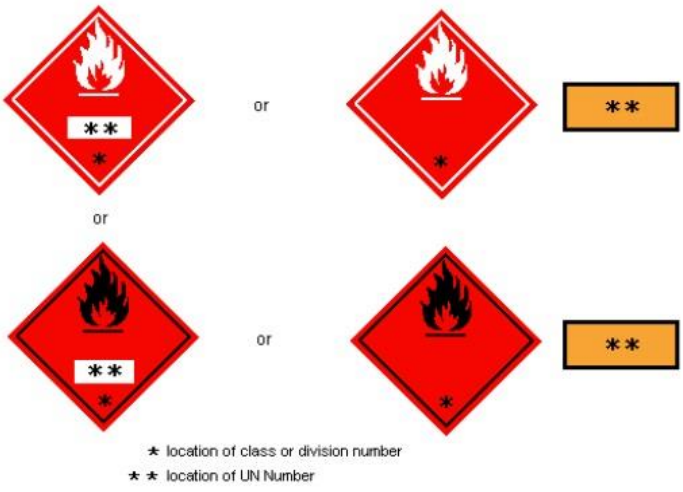

FIG. 4 EXAMPLE OF DISPLAY OF UN NUMBERS

7.3.3 *Elevated Temperature Substances*

Cargo transport units containing a substance that is in a liquid state at a temperature equal to or exceeding 100 °C or in a solid state at a temperature

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equal to or exceeding 240 °C should bear on each side and on each end the mark as shown in the Fig. 5. The triangular shaped mark should have sides of at least 250 mm and should be shown in red.

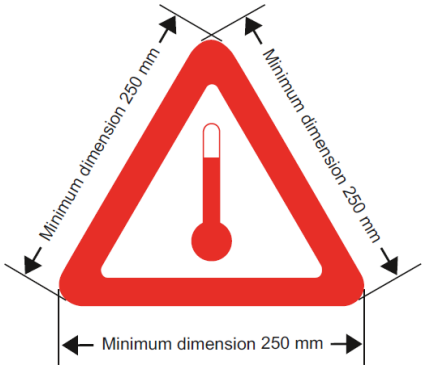


FIG. 5 MARKING FOR TRANSPORT AT ELEVATED TEMPERATURE

In addition to the elevated temperature mark, the maximum temperature of the substance expected to be reached during transport should be durably marked on both sides of the portable tank or insulation jacket, immediately adjacent to the elevated temperature mark, in characters at least 100 mm high. For portable tanks with a capacity of not more than 3 000 litres and with an available surface area insufficient to affix the prescribed marks, the minimum dimensions of the sides may be reduced to 100 mm.

7.3.4 *Environmentally Hazardous Substances Mark*

A cargo transport unit or bulk container containing environmentally hazardous substances should clearly display the environmentally hazardous substance mark having minimum dimensions 250 mm x 250 mm on at least two opposing sides of the unit or bulk container and in any case in such a position as may be seen by all those involved in the loading or unloading processes. For portable tanks with a capacity of not more than 3 000 litres and with an available surface area insufficient to affix the prescribed marks, the minimum dimensions may be reduced to 100 mm x 100 mm.

7.3.5 *Emergency Information Panel*

7.3.5.1 Every goods carriage used for transporting any dangerous goods should be legibly and conspicuously marked with an emergency information panel at three places so that the emergency information panel faces to each side of the carriage and to its rear and such panel should contain the following information:

a) The correct technical name of the dangerous goods in letters not less than 50 mm high;

b) The United Nations class number for the dangerous goods as given in **5** in numerals not less than 100 mm high;

c) The class label of the dangerous or hazardous goods of the size of not less than 250 mm square; and

d) The name and telephone number of the emergency services to be contacted in the event of fire or any other accident in letters and numerals that are not less than 50 mm high and the name and telephone number of the consignor of the dangerous goods or of some other person from whom expert information and advice can be obtained concerning the measures that should be taken in the event of an emergency involving such goods.

7.3.5.2 The information contained in **7.3.5.1** should also be displayed on the vehicle by means of a sticker relating to the particular dangerous or hazardous goods carried in that particular trip.

7.3.5.3 Every class label and emergency information panel should be marked on the goods carriage and should be kept free and clean from obstructions at all times.

NOTE — Refer Annex C for representation of Emergency Information Panel.

8 DOCUMENTATION

8.1 General

The consignor should provide requisite information and documentation to the carrier about dangerous goods to be transported, including any additional information and documentation as specified in this standard. The information may be provided in a dangerous goods transport document preferably in the format given in Annex D or in any other format agreed between consignor and carrier. In case dangerous goods are being transported in the same vehicle with non-dangerous goods, the information of dangerous goods should preferably be provided separately. It should be ensured that dangerous goods transport document should be easy to identify, legible and durable. The use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an alternative to paper documentation may be preferred.

8.2 Declaration of Dangerous Goods

The following information should be provided by the consignor/shipper in the documented form:

a) Dangerous goods description including UN number, proper shipping name, primary hazard class, subsidiary hazard class and the packing group of substance or article (for example PG-II for Packing Group II) for each dangerous substance, material or article offered for transport;

b) Name and address of the consignor and the consignee with contact numbers;

c) Total quantity of dangerous goods;

d) The temperature of good/substance at which it is being transported (in case the temperature is 100 °C or more, such consignment should be marked with Hot or Molten as the case may be);

e) For dangerous goods are transported in salvage packaging including large salvage packaging or salvage pressure receptacles, the words ‘SALVAGE PACKAGING’ or ‘SALVAGE PRESSURE RECEPTACLE’ should be included;

f) In case of self-reactive substances, organic peroxides and polymerizing substances which may require temperature control during transportation, the control and emergency temperatures should be indicated such as ‘Control temperature: .... °C Emergency temperature: .... °C’;

g) Restrictions on the mode of transport or conveyance and any necessary routing instructions;

h) Details of the emergency arrangements appropriate to the consignment; and

j) Actual holding time, where applicable, for example portable tanks carrying refrigerated liquefied gases.

NOTES

1 The format given in Annex D may be used for declaration of dangerous goods by the Shipper/Consignor/Sender.

2 For any mis-declared or undeclared dangerous goods, the provisions specific to different mode of transport under **10** should be followed.

8.3 Emergency Response Information

While transporting the dangerous goods, the following should be ensured by the carrier:

a) The emergency response telephone number should be readily available; and

b) The following information for emergency response should be available with the carrier in a separate document maintained with the other transport documents:

1) Description of the dangerous articles;

2) Immediate hazards to health;

3) Immediate methods for handling small or large fires and spills or leaks; and

4) Preliminary first aid measures.

8.4 Retention of Records

The following records and documents should be retained as documented information:

Document	*Participant Responsible*	*Retention Period*
Transport Documents	Consignor and carrier	Three months
Emergency response information	Consignee, consignor and carrier	Period of use
Training Record	Consignor, consignee and carrier	Duration of employment plus one year
Annual report (DGSA)	Consignor/ consignee/carrier	Five years
Vehicle Certification	Carrier	Period of use
Tanks Certification	Carrier/consignee/consignor	Period of use

9 PROVISIONS FOR TRANSPORTATION

9.1 General Provisions

Dangerous goods should not be offered for transport unless:

a) Goods have been properly classified, packed, marked, labelled and described and certified on a dangerous goods transport document;
b) Goods are in a fit condition for transport as required by this standard, and no dangerous residue of the dangerous goods adheres to the outside of the package;
c) Cargo transport units have been appropriately marked, labelled and placarded; and
d) Cargo transport units are in a fit condition for movement and transportation.

9.1.1 Carrier should not accept dangerous goods for transport unless:

a) a copy of the dangerous goods transport document and other documented information as prescribed in **8** are provided; or
b) the information applicable to the dangerous goods is provided in electronic form.

9.1.2 The information and documents applicable to the dangerous goods should accompany the dangerous goods during transportation to the final destination and should be provided to the consignee when the dangerous goods are delivered.

9.1.3 When the information applicable to the dangerous goods is given to the carrier in electronic form, it should be available to the carrier at all times during transport to the final destination. The information should be made available to the authorities without delay and as a paper document, if demanded.

9.1.4 The dangerous goods should not be transported unless cargo transport units are:

a) appropriately marked, labelled and placarded; and
b) in a condition to transport in accordance with this standard.

9.1.5 Packages containing dangerous goods should only be loaded in cargo transport units that are strong enough to withstand the shocks encountered during transport. The cargo transport unit should be constructed in such a way as to prevent the loss of contents and should be fitted with devices to facilitate securing and handling of dangerous goods.

9.1.6 The interior and exterior of a cargo transport unit should be inspected prior to loading to ensure that there is no damage that could affect its integrity or that of the packages to be loaded in it.

9.1.7 Cargo transport units should be loaded in a way such that incompatible dangerous goods are not placed together. Specific loading instructions such as orientation arrows direction of the goods, goods that are not to be double stacked, goods to be kept dry or other temperature control requirements should be met. The dangerous goods in liquid form should be loaded below dry dangerous goods whenever possible.

9.1.8 The packages containing dangerous goods and unpackaged dangerous articles should be secured by suitable means capable of restraining the goods (such as fastening straps, sliding slat boards, adjustable brackets) in the cargo transport unit in a manner to prevent any movement during transport which would change the orientation of the packages or cause damage. When dangerous goods are transported with other goods like heavy machinery or crates, all goods should be securely fixed or packed in the cargo transport units so as to prevent the release of dangerous goods. The movement of

packages may also be prevented by filling any voids by the use of dunnage or by blocking and bracing. Where restraints such as banding or straps are used, these should not be over-tightened to cause damage or deformation of the package.

9.1.9 Packages should not be stacked unless designed for that purpose. Where different design types of packages that have been designed for stacking are to be loaded together, consideration should be given to their compatibility for stacking with each other. Where necessary, stacked packages should be prevented from damaging the package below by the use of load-bearing devices.

9.1.10 During loading and unloading, attention should be given to the handling of packages, so that accidental damage through dragging or mishandling the packages may be avoided. In case the package is found to be damaged, it should not be transported and may be moved to a safe place.

9.2 Segregation of Dangerous Goods

9.2.1 The segregation provisions for each particular mode of transport should be based on the following principles:

a) Incompatible dangerous goods should be segregated from one another so as to effectively minimize hazards in the event of accidental leakage or spillage or any other accident;
b) Whenever dangerous goods are stowed together, the most stringent segregation provisions for any of the goods should be applied; and
c) In case, the packages required to bear a subsidiary hazard label, the segregation appropriate to the subsidiary hazard should be applied when it is more stringent than that required by the primary hazard.

9.2.2 Incompatible dangerous goods should be segregated and loaded on carrier in such a way that any possible contact of such goods is avoided during transportation. For the purposes of segregation, two substances or articles are considered mutually incompatible when their stowing together may result in undue hazards in the case of leakage, spillage, or any other accident. In this regard, detailed segregation requirements for substances and articles of Class 1 are provided in **11.1**.

9.2.3 As the extent of the hazard due to incompatible dangerous goods may vary, the segregation arrangements required should also vary as appropriate. In some instances, such segregation may be obtained by intervening spaces between such dangerous goods by filling the spaces with cargo compatible with the dangerous substances or articles.

9.2.4 An over pack should not contain dangerous goods which react dangerously with one another.

9.3 Reporting of Accidents or Incidents Involving Dangerous Goods in Transport

9.3.1 Any incidents or accidents involving transportation of dangerous goods should immediately be reported to the nearest local authorities as well as concerned person notified in the emergency response documents to deal with such situations. In case of transportation of dangerous goods at International level, the compliance of prevailing law of the country, where the incident or accidents has occurred, should be ensured.

9.3.2 Information reported should include at least the description of the goods as provided in **8.2**, description of the accident/incident, date and location, estimated loss of dangerous goods, containment information (packaging or tank type, identification marks, capacity and quantity) and cause and type of any packaging/tank failure that resulted in a release/damage of dangerous goods.

9.3.3 Certain types of dangerous goods, as determined by the competent authority or established under applicable International law, may be excepted from these guidelines for reporting of accidents or incidents.

NOTE — For reporting of accidents or incidents involving dangerous goods related to different mode of transport, the specific guidelines as per **10** should be followed.

10 ADDITIONAL PROVISIONS FOR DIFFERENT MODE OF TRANSPORTATION

10.1 Transportation by Road

In addition to other relevant and applicable requirements given in this standard, the compliance of *Carriage by Road Act*, 2007 and the *Central Motor Vehicles Rules*, 1989 shall be ensured for transportation of dangerous goods by road.

10.2 Transportation by Sea

In addition to other relevant and applicable requirements given in this standard, the compliance of *International Maritime Dangerous Goods (IMDG) code* shall be ensured for transportation of dangerous goods by sea.

10.3 Transportation by Rail

In addition to other relevant and applicable requirements covered in this standard, the compliance of *Red Tariff Rule*s (RED TARIFF No. 20) of the Ministry of Railways shall be ensured for transportation of dangerous goods by rail.

10.4 Transportation by Air

In addition to other relevant and applicable requirements covered in this standard, the compliance of International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI) and *The Aircraft* (*Carriage of Dangerous Goods*) *Rules*, 2003 shall be ensured for transportation of dangerous goods by air.

10.5 Transportation by Inland Waterways

In addition to other relevant and applicable requirements covered in this standard, the compliance of International Carriage of Dangerous Goods by Inland Waterways (ADN) shall be ensured for transportation of dangerous goods by inland waterways.

NOTE — For approvals and permissions, the provisions applicable for different mode of transportation of dangerous goods as covered under **10** should be followed.

11 SPECIAL PROVISIONS FOR ALL MODES OF TRANSPORTATION

11.1 Transport of Explosives

Considering the practicability and economical transportation of explosive (Class 1 goods or substances), a mix of such goods of Class 1 of relevant compatibility groups may be transported provided safety is not compromised at any level during handling and transportation of explosives.

11.1.1 *Compatibility Classification Codes*

(*Description of Substance or Article to be Classified*)	(*Compatibility Group*)	(*Classification Code*)
Primary explosive substance	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features. Some articles, such as detonators for blasting, detonator assemblies for blasting and primers, cap-type, are included, even though they do not contain primary explosives	B	1.1B 1.2B 1.4B
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance	C	1.1C 1.2C 1.3C 1.4C
Secondary detonating explosive substance or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features	D	1.1D 1.2D 1.4D 1.5D
Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids)	E	1.1E 1.2E 1.4E
Article containing a secondary detonating explosive substance with its own means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids) or without a propelling charge	F	1.1F 1.2F 1.3F 1.4F
Pyrotechnic substance, or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating, incendiary, tear- or smoke-producing substance (other than a water-activated article or one containing white phosphorus, phosphides, a pyrophoric substance, a flammable liquid or gel, or hypergolic liquids)	G	1.1G 1.2G 1.3G 1.4G
Article containing both an explosive substance and white phosphorus	H	1.2H 1.3H
Article containing both an explosive substance and a flammable liquid or gel	J	1.1J 1.2J 1.3J
Article containing both an explosive substance and a toxic chemical agent	K	1.2K 1.3K
Explosive substance or article containing an explosive substance and presenting a special hazard (for example due to water-activation or presence of hypergolic liquids,	L	1.1L 1.2L 1.3L

(*Concluded*)

(*Description of Substance or Article to be Classified*)	(*Compatibility Group*)	(*Classification Code*)
phosphides or a pyrophoric substance) and needing isolation of each type		
Articles predominantly containing extremely insensitive substances	N	1.6N
Substance or article so packed or designed that any hazardous effects arising from accidental functioning are confined within the package unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder or prohibit firefighting or other emergency response efforts in the immediate vicinity of the package	S	1.4S

NOTES

1 Articles of compatibility groups D and E may be fitted or packed together with their own means of initiation provided that such means have at least two effective protective features designed to prevent an explosion in the event of accidental functioning of the means of initiation. Such articles and packages should be assigned to compatibility groups D or E.

2 Articles of compatibility groups D and E may be packed together with their own means of initiation, which do not have two effective protective features when, in the opinion of the competent authority, the accidental functioning of the means of initiation does not cause the explosion of an article under normal conditions of transport. Such packages should be assigned to compatibility groups D or E.

11.1.2 *Classification of Explosives with Compatibility Group*

Hazard Division	*Compatibility Group*												
	A	B	C	D	E	F	G	H	J	K	L	N	S
1.1	1.1A	1.1B	1.1C	1.1D	1.1E	1.1F	1.1G		1.1J		1.1L		
1.2		1.2B	1.2C	1.2D	1.2E	1.2 F	1.2 G	1.2H	1.2J	1.2K	1.2L		
1.3			1.3C			1.3F	1.3G	1.3H	1.3J	1.3K	1.3L		
1.4		1.4B	1.4 C	1.4D	1.4E	1.4F	1.4G						1.4S
1.5				1.5D									
1.6												1.6N	

11.1.3 *Provisions of Transportation for Compatibility Groups A to K and N*

Goods in Compatibility Groups A to K and N may be transported in accordance with the following provisions:

a) Packages bearing the same compatibility group letter and the same division number may be transported together;
b) Goods of the same compatibility group but different divisions may be transported together provided that the whole is treated as belonging to the division having the smaller number. However, when goods of Division 1.5, Compatibility Group D, are transported together with goods of Division 1.2, Compatibility Group D, and the total of the consignment should be treated as Division 1.1, Compatibility Group D, for the purposes of transport; and
c) Packages bearing different compatibility group letters should not in general be transported together (regardless of the division number) except in the case of compatibility group letters C, D, E and S.

NOTE — Other combinations of compatibility groups A to K and N may be permitted under provisions applicable to the individual mode of transport.

11.1.4 *Provisions of Transportation for Compatibility Groups C, D and E*

Goods in compatibility groups C, D and E are permitted to be carried together in the same unit load or cargo transport unit provided the overall classification code should be determined in accordance with the classification procedures given in UN Model Regulations on the transportation of dangerous goods. The appropriate division should be determined in accordance with **11.1.3 b)**. Any combination of articles in compatibility groups C, D and E should be assigned to compatibility group E. Any combination of substances in compatibility groups C and D should be assigned to the most appropriate of the compatibility groups shown in **11.1.2**, taking cognizance of the predominant characteristics of the combined load.

11.1.5 *Provisions of Transportation for Compatibility Groups S*

Goods in Compatibility Group S may be transported with goods in all compatibility groups other than A and L.

11.1.6 *Provisions of Transportation for Compatibility Groups L*

Goods in Compatibility Group L should not be transported with goods in other compatibility groups. Furthermore, goods in compatibility group L should only be transported with the same type of goods within compatibility group L.

11.1.7 *Provisions of Transportation for Compatibility Groups N*

Goods of Compatibility Group N should not in general (*see* **11.1.3 b)**) be transported with goods in other compatibility groups except S. However, if these goods are transported together with goods of compatibility groups C, D and E the goods of compatibility group N should be considered as goods having compatibility group D (*see* also **11.1.4**).

11.1.8 *Provisions of Mixed Transport of Goods of Class 1 with Dangerous Goods of other Classes*

For mixed transport of goods of Class 1 with dangerous goods of other classes the following provisions should be ensured:

a) Except where otherwise specially provided for in this standard, goods of Class 1 should not be transported together in freight containers, vehicles or wagons with dangerous goods of other classes;
b) Goods in Division 1.4, compatibility group S, may be transported together with dangerous goods of other classes;
c) Basting explosives (except UN 0083 Explosive, blasting, type C) may be transported together with ammonium nitrate (UN Nos. 1942 and 2067), ammonium nitrate emulsion or suspension or gel (UN 3375) and alkali metal nitrates (for example UN 1486) and alkaline earth metal nitrates (for example UN 1454) provided the aggregate is treated as blasting explosives under Class 1 for the purposes of placarding, segregation, stowage and maximum permissible load;

NOTE — Alkali metal nitrates include caesium nitrate (UN 1451), lithium nitrate (UN 2722), potassium nitrate (UN 1486), rubidium nitrate (UN 1477) and sodium nitrate (UN 1498). Alkaline earth metal nitrates include barium nitrate (UN 1446), beryllium nitrate (UN 2464), calcium nitrate (UN 1454), magnesium nitrate (UN 1474) and strontium nitrate (UN 1507).

d) Life-saving appliances (UN Nos. 3072 and 2990) containing Class 1 goods as equipment may be transported together with the same dangerous goods as contained in the appliances; and
e) Air bag inflators, or air bag modules, or seat-belt pretensioners, of Division 1.4, compatibility group G, (UN 0503) may be transported with air bag inflators or air bag modules or seat-belt pretensioners of Class 9 (UN 3268).

11.2 Transport of Gases

Aerosols transported for the purposes of reprocessing or disposal should only be transported in well-ventilated cargo transport units other than closed freight containers.

11.3 Transport of Self-Reactive Substances

11.3.1 All self-reactive substances, organic peroxides and polymerizing substances should be protected from direct sunlight and all sources of heat, and placed in adequately ventilated areas.

11.3.2 Where a number of packages are assembled in a freight container, closed road vehicle or unit load, the total quantity of substance, the type and number of packages and the stacking arrangement should not create an explosion hazard.

11.4 Transport of Toxic and Infectious Substances

11.4.1 *Toxic Substances*

11.4.1.1 *Segregation from foodstuffs*

The substances marked as or known to be toxic (packing groups I, II and III) should not be carried in the same railway wagon, lorry, hold of a ship, compartment of an aircraft or other cargo transport unit with substances marked as or known to be foodstuffs, feeds or other edible substances intended for consumption by humans or animals. The relaxation of this position may be allowed for substances of packing groups II and III provided the competent authority is satisfied that the packing and segregation are adequate to prevent the contamination of foodstuffs, feeds or other edible substances intended for consumption by humans or animals.

11.4.1.2 *Decontamination of cargo transport units*

A railway wagon, lorry, cargo space of a ship, compartment of an aircraft or other cargo transport unit which has been used to carry substances marked as or known to be toxic (packing groups I, II and III) should, before re-use, be inspected for contamination. A railway wagon, lorry, hold of a ship, compartment of an aircraft or other cargo transport unit which has been contaminated should not be returned to service until such contamination has been removed.

11.4.2 *Infectious Substances*

11.4.2.1 *Responsibility of carrier*

The carriers and their staff responsible for transportation of dangerous goods should fully understand all applicable regulations for the packing, labelling, transport and documentation of consignments of infectious substances. The carrier should accept and expedite the transport of consignments conforming to the rules in force. If the carrier finds any error in the labelling or documentation, it should be immediately notified to the consignor or consignee so that the appropriate corrective measures should be taken.

11.4.2.2 *Actions to be taken in the event of damage or leakage*

The person responsible for the carriage of packages containing infectious substances who becomes aware of damage to or leakage from such packages should:

a) avoid handling the package or keep handling to a minimum;
b) inspect adjacent packages for contamination and put aside any that may have been contaminated;
c) inform the appropriate public health authority or veterinary authority, and provide information on any other countries of transit where persons may have been exposed to danger; and
d) notify the consignor and/or the consignee.

11.4.2.3 *Decontamination of cargo transport units*

A railway wagon, road vehicle, cargo space of a ship, compartment of an aircraft or other cargo transport unit which has been used to transport infectious substances should be inspected for release of the substance before re-use. If the infectious substances were released during transport, the cargo transport unit should be decontaminated before it is re-used. Decontamination should be achieved by any means which effectively inactivates the released infectious substance.

11.5 Transport of Radioactive Material

The compliance of requirements for the safe transport of radioactive material as prescribed in *AERB Safety Code No. AERB/NRF-TS/SC-1 (Rev.1)* issued by Atomic Energy Regulatory Board shall be ensured.

11.6 Transport of Portable Tanks

Portable tanks should only be transported on vehicles whose fastenings are capable, in conditions of maximum permissible loading of the portable tanks.

12 TRAINING

12.1 The persons engaged in the transport of dangerous goods should be trained in the contents of

dangerous goods requirements commensurate with their responsibilities.

12.2 The training should be imparted to the individuals who,

a) classify dangerous goods;
b) pack dangerous goods;
c) mark and label dangerous goods;
d) prepare transport documents for dangerous goods;
e) offer or accept dangerous goods for transport;
f) carry or handle dangerous goods in transport;
g) load or unload packages of dangerous goods; and
h) directly involved in the transport of dangerous goods including driver, crew members and as determined by the competent authority.

12.3 The training to individuals should include the following aspects:

a) *General Awareness* — The following general awareness training should be provided:

1) Each person should be trained in order to be familiar with the general provisions of dangerous goods transport requirements; and

2) Training should include a description of the classes of dangerous goods; labelling, marking, placarding, packaging, segregation, handling and compatibility requirements; a description of the purpose and content of the dangerous goods transport document; and a description of available emergency response documents;

b) *Function-Specific Training* — Each person involved in dangerous goods transport should be trained for the specific function requirements that person performs;

c) *Safety Training* — Commensurate with the risk of exposure in the event of a release and the functions performed, each person should be trained for the followings:

1) Methods and procedures to avoid accidents such as proper use of package-handling equipment and appropriate methods of stowage of dangerous goods;
2) Competency to act on available emergency response information;
3) Preventing exposure to hazards and general dangers presented by the various classes of dangerous goods including the use of personal protective clothing and equipment; and
4) Immediate procedures in the event of an unintentional release of dangerous goods, including emergency response procedures and personal protection procedures should be followed.

d) *Minimum Qualification of Road Driver* — In addition to valid driving license to drive a transport vehicle, the driver should read and write one Indian language as well as English. Also, the driver should have a certificate having successfully passed 3 days course in transportation of dangerous goods from the institute/training centre recognized by the state government/MoRTH. The curriculum of such training courses should be in line with curriculum given in CMVR. Thereafter, license holder should get the license endorsed at Regional Transport Office (RTO) for driving a vehicle carrying dangerous goods.

12.4 Training to Individuals for Different Modes of Transport

For any specific requirements related to training applicable to different mode of transport, the provisions given under **10** should be followed.

12.5 Records of Training

The records of training should be kept by the employer and made available to the employee or the competent authority, upon request. These records should be kept by the employer for a period of time established by the competent authority.

13 SECURITY AND SAFETY PROVISIONS

All persons engaged in the transport of dangerous goods should comply with the following security and safety provisions for the transport of dangerous goods commensurate with their responsibilities:

a) Each crew member involved in transporting dangerous goods should carry documents such as photo identification issued by the government, driving license, medical/fitness certificate (vision and general health) and other relevant documents depending on mode of transport;
b) An emergency escape mask should be available with each crew member of the vehicle carrying goods with Division 2.3 or Division 6.1;

c) A shovel, a drain seal and a compatible collecting container should be available in the vehicle carrying solids and liquids of Class 3, Division 4.1, Division 4.3, Class 8 and Class 9 only;
d) The crew should carry a first aid kit and any other safety items identified in risk assessment (for example chemical spill kit, chemical over suit, protective overalls, safety boots, hard hat etc);
e) Each member of the crew should carry a torch, a pair of protective gloves, safety glasses, eye wash and a warning vest along with two self-standing warning signs for the vehicle;
f) Consignors should only offer dangerous goods to carriers that have been appropriately identified;
g) Transit sites, such as airside warehouses, marshalling yards and other temporary storage areas should be properly secured, well-lit and, where possible, not be accessible to the general public; and
h) The consignment should be halted as soon as possible, if during the journey, an infringement occurs which could jeopardize the safety of the operation, bearing in mind the requirements of traffic safety, safe immobilization of the consignment and public safety. The transport operation should only be continued once the consignment complies with applicable laws and guidelines given in this standard.

14 ROLE OF PARTICIPANTS/STAKEHOLDERS

14.1 Consignor/Shipper

The consignor/shipper should have a place of business in the state. If no person in the state satisfies this requirement, the consignee of the goods should assume the duties of the consignor. When the consignor acts on behalf of a third party, the latter should inform the consignor in writing that dangerous goods are involved and provide all the information and documents needed to perform the consignor's obligations.

The consignor/shipper should in particular:

a) ascertain that the dangerous goods are classified and authorized for carriage in accordance with provisions given in this standard;
b) furnish the carrier with information and data and, if necessary, the required transport documents including TREM card, Safety Data Sheet (SDS) and accompanying documents (authorizations, approvals, notifications, certificates, etc). The consignor should ensure that a carrier is informed in advance of the nature of the dangerous goods to be picked up and, when a driver arrives on site, ensure that all necessary documentation is provided;
c) use only packaging, large packaging, intermediate bulk containers (IBCs) and tanks (tank-vehicles, demountable tanks, battery-vehicles, MEGCs, portable tanks and tank containers) approved for and suited to the carriage of the substances concerned and bearing the markings prescribed in **7.** The tanks shall be approved by PESO/any other government agency, where required, to meet the regulatory requirements;
d) comply with the provisions on the means of dispatch and on forwarding restrictions as prescribed in **9**;
e) comply with security and safety measures as prescribed in **13**;
f) ensure that the driver(s) involved in transportation of dangerous goods carrying an appropriate driver training certificate and photo identity. Also ensure that vehicle is equipped with first-aid, safety equipment and antidotes as may be necessary;
g) to make transport agency aware of the risks involved in transportation of dangerous goods to health or safety of any person;
h) ensure emergency procedures are in place as prescribed in **18**;
j) ensure all persons involved in transportation of dangerous goods are appropriately trained in advance as prescribed in **12**;
k) ensure that the carrier should be fitted with Automatic Vehicle Location Tracking (AVL) System with an integrated emergency system preferably conforming to IS 16833; and
m) consignor in consultation with consignee and carrier should prepare route map for transportation of dangerous goods and same may be monitored by consignor/consignee. The carrier should be responsible to follow the decided route map and any deviation, if any should be brought to the knowledge of consignor/consignee along with the justification.

14.2 Carrier

The carrier should ensure that:

a) the goods carriage has a valid registration to carry the said goods and the said carriage is safe for the transport of the said goods;
b) the vehicle is equipped with necessary first-aid, safety equipment including fire extinguishers, toolbox and antidotes as may be necessary to contain any accident;

c) the driver of the goods carriage carrying dangerous goods holds and carry a valid driving licence;
d) the dangerous goods to be carried are authorized for carriage in accordance with this standard;
e) all information prescribed in **8.2** provided by the consignor before carriage is complete and accurate in all respects and correspond to the classification of such goods as specified in **5**;
f) a monitoring/audit procedure is carried out to assess the transport vehicle for defects, leakages, cracks, missing equipment, etc. and to check whether the date of the next test/maintenance for the transport vehicle has not expired;
g) the vehicle is not overloaded;
h) the danger labels and markings for the vehicle have been affixed as per **7**;
j) security and safety measures are in place as prescribed in **13**;
k) emergency procedures are in place as prescribed in **18**;
m) both driver and crew are suitably trained in advance of any work involving dangerous goods as per **12**;
n) drivers should also hold an appropriate driver training certificate;
p) the laid down route plan for each trip should be followed by the driver unless directed or permitted by the police/local authorities and also fix a time table for each trip to the destination should be laid down and followed; and
q) CMVR and/or state government notifications are followed on the restriction of working hours of drivers in case of transportation by road.

14.3 Driver and Vehicle Crew

In addition to compliance of the provisions given under *Motor Vehicle Driving Regulations* 2017, drivers and/or crew members should ensure the followings in particular:

a) Carry their driver training certificate, valid driving licence and photo identity card as relevant;
b) Read and understood transport documentation provided in advance of any transport operation. If an issue does arise with the documentation, the crew members should raise and rectify any matter prior to the start of the journey;
c) All documents related to transportation of dangerous goods including TREM card should be kept in the driver's cabin and available at all times during the trip;
d) Keep written emergency instructions readily available in the vehicle;
e) All safety equipment and PPE should be available in the vehicle and in case of any deficiency or missing items, inform the carrier immediately;
f) The vehicle is properly plated, placarded, marked and is kept clean. The plates, placards and other mark which are not required should be removed or covered;
g) The damaged or leaking packages should not be loaded;
h) Apart from members of the vehicle crew, no passengers should be carried in transport units carrying dangerous goods;
j) Not to open a package containing dangerous goods during transit;
k) Any torch or lighting apparatus used should not exhibit any metal surface liable to produce sparks;
m) No smoking should be done during handling operations in the vicinity of the vehicle and inside the vehicle;
n) The engine should be shut off during loading and unloading operations, except where it has to be used to drive the pumps or other appliances and the laws of the country in which the vehicle is operating permit such use;
p) No vehicles carrying dangerous goods should be parked without the parking brakes being applied and that trailers without braking devices are restrained from moving by applying at least one-wheel chock;
q) If responsible for tank filling or emptying, ensure compliance of **14.5**;
r) The occurrence of an accident should be reported immediately to the nearest police station/local authorities, concerned person notified in the emergency response documents and also the owner of the goods carriage or the transporter;
s) Adhere to the supervision provisions of the vehicle; and
t) Special care needs to be taken while travelling with dangerous goods by maintaining safer speeds and safer gaps (both front and back) with other vehicles on the road. A marking on the back of the vehicle mentioning 'Danger-Maintain at least 30 m distance' is desirable.

14.4 Packer

The packer should ensure:

a) compliance of the provisions concerning packing, or mixed packing as prescribed in **6**; and

b) compliance of the provisions concerning marking and labelling of the packages as prescribed in **7** while preparing packages for carriage.

NOTE — These provisions may vary and inputs may be taken from DGSA, if required.

14.5 Filler

The filler in particular should ensure that:

a) prior to the filling of tanks, the equipment is in a satisfactory technical condition;
b) the date of the next test for the transport vehicle is not expired;
c) only authorized tanks are filled with the dangerous goods for carriage;
d) not more than the maximum permissible degree of filling or the maximum permissible mass of contents per litre of capacity for the substance while filling the tank;
e) no dangerous residues of the filling substance adhere to the outside of tanks filled or emptied;
f) closing devices are leak-proof after filling the tank;
g) no dangerous residue of the filling substance adheres to the outside of the tank;
h) the placards and labels are affixed on the tanks, containers and vehicle in accordance with this standard;
j) the compliance of relevant provisions of this standard while filling vehicles or containers with dangerous goods are followed; and
k) there is a good electrical connection to the earth prior to the emptying or filling operation as may be appropriate (for example flammable liquids).

14.6 Loader

The loader should ensure the following:

a) Handover the dangerous goods to the carrier only if they are authorized for carriage in accordance with provisions given in this standard;
b) When handing over the dangerous goods to the carrier check the packaging for any damage. The loader should not hand over a package if its packaging is damaged, especially if it is not leak-proof and there are leakages or the possibility of leakages of the dangerous substance, until the damage has been repaired;
c) While loading dangerous goods in a vehicle, or a large or small container, ensure compliance of the special requirements concerning loading and handling as mentioned in this standard;
d) Compliance of the provisions concerning danger markings after loading dangerous goods into a container as prescribed in **7**; and
e) To comply with the prohibitions on mixed loading, taking into account the dangerous goods already loaded in the vehicle. In addition, also ensure the compliance of the requirements concerning the separation of foodstuffs, other articles of consumption or animal feedstuffs.

14.7 Tanker Operator

The operator of the tank-container/portable tank should be responsible for all related operations and ensure:

a) compliance with the requirements for construction, equipment, tests and markings as given in this standard;
b) that the maintenance of shells and their equipment is carried out in such a way that under normal operating conditions, the tank container/portable tank satisfies the requirements of this standard until the next inspection; and
c) to have an exceptional check made when the safety of the shell or its equipment is liable to be impaired by a repair, an alteration or an accident.

14.8 Unloader

The unloader should in particular ensure the following:

a) Ascertain that the correct goods are unloaded by comparing the relevant information on the transport document with the information on the package, container, tank, MEMU, MEGC or vehicle;
b) Before and during unloading, should verify whether the packaging, the tank, the vehicle or the container is damaged to an extent which would endanger the unloading operation. In such case of damage, the unloading should not be carried out until appropriate measures have been taken;
c) Immediately following the unloading of the tank, vehicle or container:
    1) remove any dangerous residues which have adhered to the outside of the tank, vehicle or container during the process of unloading; and
    2) ensure the closure of valves and inspection openings;
d) The containers once completely unloaded, cleaning, decontamination and removal of

danger markings display on vehicle are carried-out; and

e) In case the unloader makes use of the services of other participants (cleaner, decontamination facility etc), the appropriate measures should be taken to ensure the compliance of this standard.

14.9 Consignee (Customer or Recipient)

The consignee who takes charge of the dangerous goods when delivered should ensure the following:

a) Not to defer acceptance of the goods without compelling reasons and should verify the compliance of this standard after unloading;
b) In the case of an infringement of the requirements of this standard, the consignee may immediately inform the consignor or carrier and return the container to the carrier, if needed, and only after the infringement has been remedied, the container should be accepted; and
c) If the consignee makes use of the services of other participants (unloader, cleaner, decontamination facility etc), the appropriate measures should be taken to ensure compliance of this standard.

14.10 Dangerous Goods Safety Advisor – DGSA

The consignor, consignee or carrier responsible for packing, handling, loading, unloading and transportation of dangerous goods on regular basis should preferably appoint at least one Dangerous Goods Safety Advisor (DGSA). A formally appointed DGSA may be an employee, the head of the business or an external consultant. DGSA should be a certified/trained person and successfully pass specified exam(s) as recommended by the competent authority.

The main responsibilities of a DGSA are as follows:

a) Ensuring compliance of rules and regulations pertaining to the packaging, transportation and storage of dangerous goods;
b) Advising on the potential security aspects and risk involved of transport of each consignment;
c) Advising on the selection of carriage for dangerous goods;
d) Investigating, preparing and compiling reports on any accidents or emergencies;
e) Prepare and submit an annual report to management of transport agency or a local public authority, as appropriate, on the activities in the carriage of dangerous goods including incidents of accidents and emergencies. The records of reports should be retained for five years and made available to the authorities on demand; and
f) Periodic review of training mechanism and behavioral aspects of carrier crew.

15 NON-COMPLIANCE

15.1 In the case of non-compliance of any provision of this standard, potential non-conformity should be informed to the consignor, consignee or carrier responsible for packing, handling, loading, unloading and transportation of dangerous goods.

15.2 The consignor, consignee or carrier as appropriate, should:

a) take immediate steps to mitigate the consequences of the non-compliance;
b) investigate the non-compliance and its causes, circumstances and consequences;
c) take appropriate steps to identify the causes of non-compliance and take corrective actions as well as preventive actions to avoid recurrence of the non-compliance; and
d) communicate the investigation report to the management and relevant authorities, as appropriate, which includes the causes of the non-compliance and the corrective or preventive actions taken or to be taken.

15.3 The communication of the non-compliance to the consignor and relevant competent authorities should be made as soon as practicable and it should be immediate whenever an emergency exposure situation has developed or is developing.

16 USE OF GPS AND IT

Trucks carrying Dangerous Goods should be equipped with a GPS device for visibility and real time monitoring of the cargo to ensure the following:

a) Route guidance and avoidance of congested areas;
b) Immediate assistance in case of accidents;
c) RFID (Radio Frequency Identification) chips would help to save time/delays at tolls and checkpoints;
d) Assessment of risks in case of traversing through tunnels or over-bridges; and
e) Assistance in loading pattern of the vehicle (as prevalent on ships).

17 CERTIFICATION AND INSPECTION

Certification and Inspections should be a regular feature in the movement of dangerous goods.

17.1 Certification

The following certifications should be ensured by the carrier agency:

a) Vehicle and carriage fitness;
b) Medical fitness certificate of drivers and crew members handling dangerous goods;
c) Proper loading inspection; and
d) Mandatory equipment.

17.2 Inspection and Role of Local Authorities

The local authorities, such as police, fire service department, state PWD, highway toll plaza, should ensure the followings, as relevant, for the safe movement of dangerous goods:

a) Provide adequate infrastructure in terms of proper wide roads and lights in order to avoid accidents;
b) The highway patrol should ensure the smooth flow of traffic on the highways and highway rescue squads need to be set up at critical locations for rendering prompt response in case of accidents;
c) Local police should be aware of the provisions for transportation of dangerous goods under the CMVR and verify the compliance;
d) Continuous monitoring of movement of transportation of dangerous goods. A dedicated consignment tracking system should preferably be made by the local authorities which should be linked to fire, police and emergency control rooms including medical services; and
e) The RTO should carry out the verification of the consignment and the carrier to ensure compliance of the provisions given in this standard.

18 EMERGENCY ACTION

18.1 All employers including consignee, consignor and transport agency are responsible to carry out a risk assessment and prepare emergency action procedure to minimize and control hazards.

18.2 All the participants engaged in different operations of transportation of dangerous goods including driver and other crew members should be provided training, all relevant documents, and procedures relevant to operations and supervision to act on emergency action procedure.

18.3 All the participants engaged in various processes including packaging, labeling, handling and transport of dangerous goods should have documented procedures, as appropriate, to deal with the situations such as:

a) chemical spills;
b) fire explosion;
c) road traffic incidents involving dangerous goods;
d) personal and/or environmental contamination; and
e) security incidents/loss of dangerous goods.

To deal with such accidents, the driver as well as the transport agency should notify the emergency services, of any immediate risk to public safety, property or the environment.

NOTE — Compliance of act/rules/notifications issued by government and relevant to transportation of all the classes of dangerous goods should be ensured.

ANNEX A
(*Clause* 4)

ACTS, RULES AND REGULATIONS

Sl No.	Act/Rules/Notification
1.	Carriage by Road Act, 2007
2.	Central Motor Vehicles Rules, 1989
3.	Explosive Rules, 2008
4.	Petroleum Rules, 2002
5.	Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 as amended
6.	The Factories Act, 1948
7.	The Chemical Accidents (Emergency, Planning, Preparedness and Response) Rules 1996, Ministry of Environment, Forest and Climate Change
8.	The Aircraft (Carriage of Dangerous Goods) Rules, 2003

ANNEX B
(*Clause* 7.1)

LABELS FOR PACKAGES

B-1 LABELS/TRANSPORT PICTOGRAM

Label Model No.	*Division or Category*	*Symbol and Symbol Colour*	*Background*	*Figure in Bottom Corner (and Figure Colour)*	*Specimen Labels*	*Note*
			Class 1: Explosive Substances or Articles			
1	Divisions 1.1, 1.2, 1.3	Exploding bomb: black	Orange	1 (black)		-** Place for division – to be left blank if explosive is the subsidiary hazard -* Place for compatibility group – to be left blank if explosive is the subsidiary hazard
1.4	Division 1.4	1.4: black Numerals should be about 30 mm in height andbe about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.5	Division 1.5	1.5: black Numerals should be about 30 mm in height andbe about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.6	Division 1.6	1.6: black Numerals should be about 30 mm in height andbe about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group

(*Continued*)

Label Model No.	*Division or Category*	*Symbol and Symbol Colour*	*Background*	*Figure in Bottom Corner (and Figure Colour)*	*Specimen labels*	*Note*
Class 2: Gases						
2.1	Division 2.1: Flammable gases	Flame: black or white	Red	2 (black or white)		-
2.2	Division 2.2: Non-flammable, non-toxic gases	Gas cylinder: black orwhite	Green	2 (black or white)		-
2.3	Division 2.3:Toxic gases	Skull and crossbones :black	White	2 (black)		-

Label Model No.	*Division or Category*	*Symbol and Symbol Colour*	*Background*	*Figure in Bottom Corner (and Figure Colour)*	*Specimen Labels*	*Note*
Class 3: Flammable Liquids						
3	-	Flame: black or white	Red	3 (black or white)	 	-
Class 4: Flammable Solids; Substances Liable to Spontaneous Combustion; Substances which, in Contact with Water, Emit Flammable Gases						
4.1	Division 4.1: Flammable solids, self-reactive substances, polymerizing substances andsolid desensitized explosives	Flame: black	White with 7 vertical red stripes	4 (black)		-
4.2	Division 4.2: Substances liable to spontaneous combustion	Flame: black	Upper half white, lowerhalf red	4 (black)		-
4.3	Division 4.3: Substances which, in contact with water emit flammable gases	Flame: black or white	Blue	4 (black or white)	 	-

(*Continued*)

Label Model No.	*Division or Category*	*Symbol and Symbol Colour*	*Background*	*Figure in Bottom Corner (and Figure Colour)*	*Specimen Labels*	*Note*
Class 5: Oxidizing Substances and Organic Peroxides						
5.1	Division 5.1: Oxidizing substances	Flame over circle: black	Yellow	5.1 (black)		-
5.2	Division 5.2: Organic peroxides	Flame: black or white	Upper half red, lower half yellow	5.2 (black)	 	-
Class 6: Toxic Substances and Infectious Substances						
6.1	Division 6.1: Toxic substances	Skull and crossbones: black	White	6 (black)		-
6.2	Division 6.2: Infectious substances	Three crescents superimposed on acircle: black	White	6 (black)		The lower half of the label may bear the inscriptions: "INFECTIOUS SUBSTANCE" and "In the case of damage or leakage immediately notify Public Health Authority" in black colour

(*Continued*)

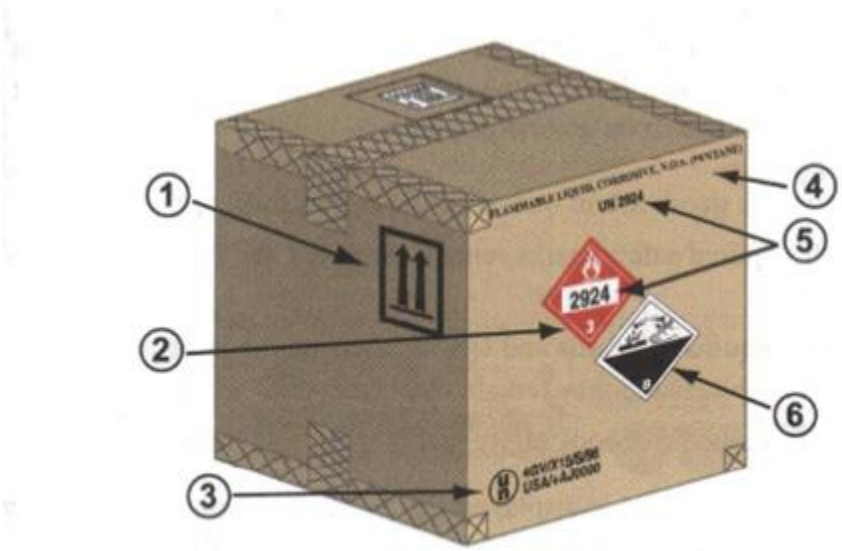
Label model No.	*Division or Category*	*Symbol and Symbol Colour*	*Background*	*Figure in Bottom Corner (and Figure Colour)*	*Specimen Labels*	*Note*
Class 7: Radioactive Material						
7A	Category I -WHITE	Trefoil: black	White	7 (black)		Text (mandatory), black in lower half of label:“RADIOACTIVE” “CONTENTS ...” “ACTIVITY ...” One red vertical bar should follow the word:“RADIOACTIVE”
7B	Category II -YELLOW	Trefoil: black	Upper half yellow with whiteborder, lower half white	7 (black)		Text (mandatory), black in lower half of label:“RADIOACTIVE” “CONTENTS ...” “ACTIVITY ...” In a black outlined box: “TRANSPORT INDEX”; Two red vertical bars should follow the word:“RADIOACTIVE”
7C	Category III -YELLOW	Trefoil: black	Upper half yellow with whiteborder, lower half white	7 (black)		Text (mandatory), black in lower half of label:“RADIOACTIVE” “CONTENTS ...” “ACTIVITY ...” In a black outlined box: “TRANSPORT INDEX”. Three red vertical bars should follow the word:“RADIOACTIVE”
7E	Fissile material	-	White	7 (black)		Text (mandatory): black in upper half of label: “FISSILE”; In a black outlined box in the lower half of label: “CRITICALITY SAFETY INDEX”

(*Continued*)

Label Model No.	*Division or Category*	*Symbol and Symbol Colour*	*Background*	*Figure in Bottom Corner (and Figure Colour)*	*Specimen Labels*	*Note*
Class 8: Corrosive substances						
8	-	Liquids, spilling from two glass vessels andattacking a hand and a metal: black	Upper half white, lower half black with white border	8 (white)		-
Class 9: Miscellaneous Dangerous Substances and Articles, Including Environmentally Hazardous Substances						
9	-	7 vertical stripes in upper half: black	White	9 underlined (black)		-
9A	-	7 vertical stripes in upper half:black; battery group, one broken and emittingflame in lower half: black	White	9 underlined (black)		-

B-2 TYPICAL LABEL WITH DETAILS

See Fig. 6.



(1) Orientation label (optional)	(2) Primary class label	(3) Standardized UN certification (according to standard)
(4) Shipping name	(5) UN number	(6) Subsidiary class label

FIG. 6 DANGEROUS GOODS PACKAGE WITH LABELS

ANNEX C
(*Clause* 7.3)

EMERGENCY INFORMATION PANEL

C-1 EMERGENCY INFORMATION PANELS POSITION

See Fig. 7.

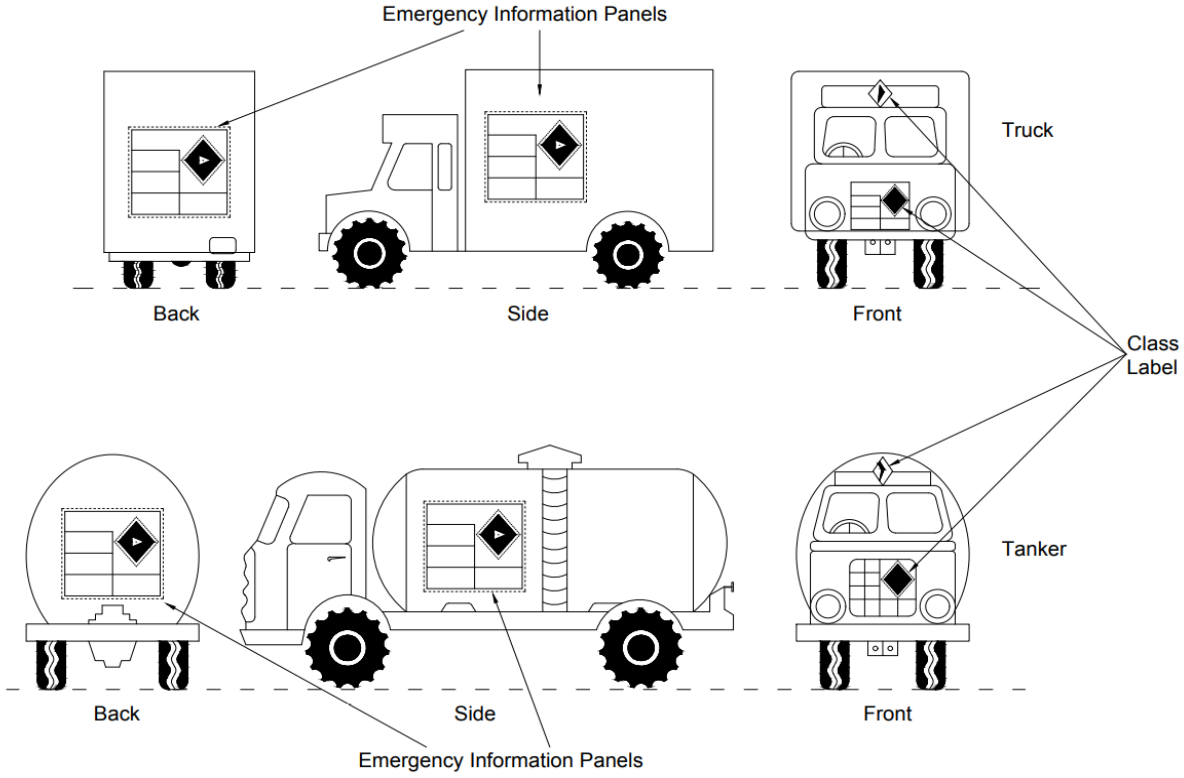


FIG. 7 PLACES FOR FIXING EMERGENCY INFORMATION PANELS ON VEHICLES

C-2 EMERGENCY INFORMATION PANEL DIMENSIONS

See Fig. 8.

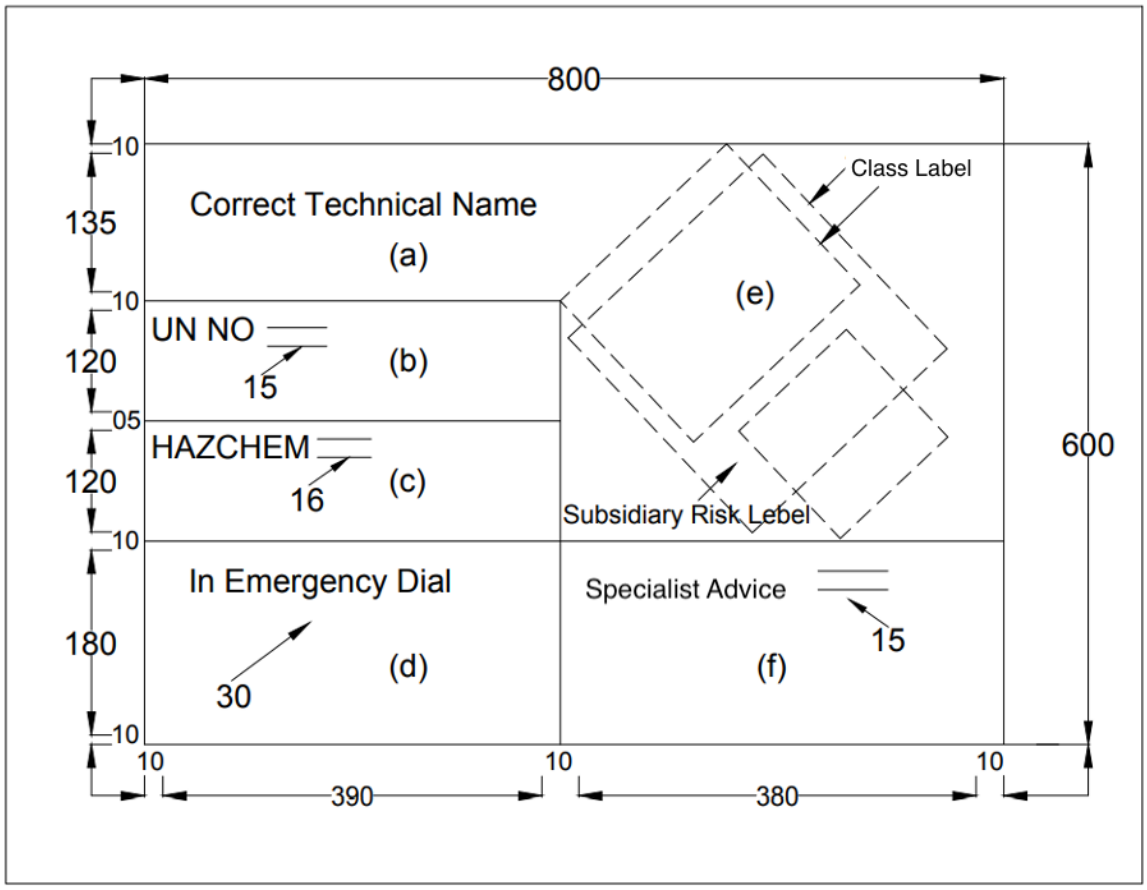


FIG. 8 PANEL DIMENSIONS (All dimensions in mm)

C-3 TYPICAL EXAMPLES SHOWING EMERGENCY INFORMATION PANEL

See Fig. 9 and Fig. 10.

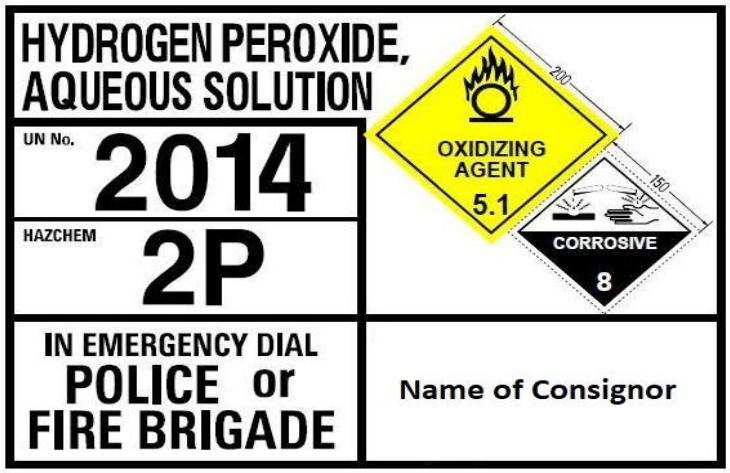
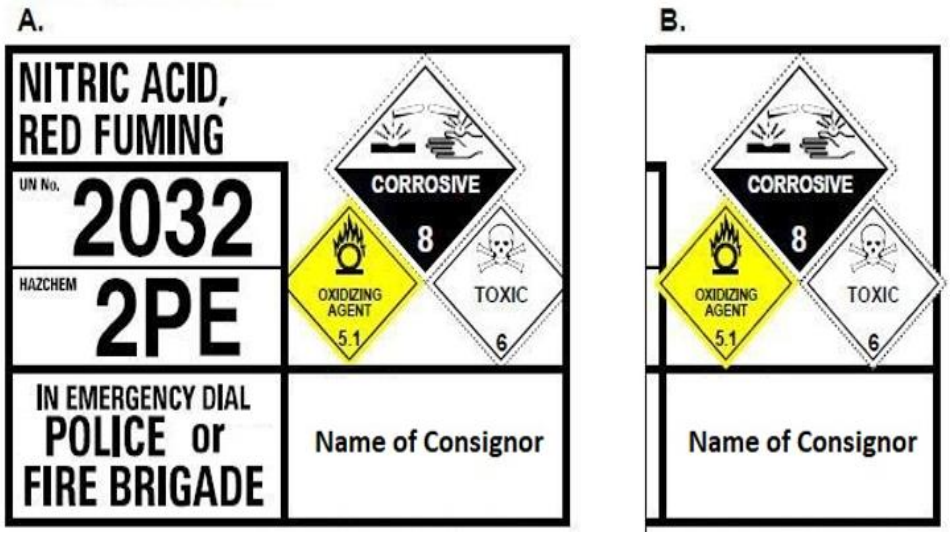


FIG. 9 SINGLE SUB RISK



A. 200 mm square Primary Hazard Label trimmed to fit

B. 50 mm square Sub-Risk Labels permitted to overlap borders

FIG. 10 TWO SUB RISK

NOTE — For labels/transport pictogram, additional provisions applicable for different mode of transportation of dangerous goods as per **10** should be followed

ANNEX D

(*Clause* 8.2)

DANGEROUS GOODS DECLARATION FORM

<table>
<tr><td colspan="2">1 Shipper/Consignor/Sender</td><td colspan="2">2 Transport document number</td></tr>
<tr><td colspan="2" rowspan="2"></td><td>3 Page No. of</td><td>4 Shipper’s Reference</td></tr>
<tr><td></td><td>5 Freight Forwarder’s Reference</td></tr>
<tr><td colspan="2">6 Consignee</td><td colspan="2">7 Carrier (to be completed by the carrier)</td></tr>
<tr><td colspan="2"></td><td colspan="2">SHIPPER’S DECLARATION
I hereby declare that the contents of this consignment are fully and accurately described below by the Proper Shipping Name, and are classified, packaged, marked and labelled/placarded and are in all respects in proper condition for transport according to the applicable international and national governmental regulations.</td></tr>
<tr><td colspan="2">8 This Shipment is within the Limitations Prescribed for:
(Delete non-Applicable)</td><td colspan="2" rowspan="4">9 Additional Handling Information</td></tr>
<tr><td>Passenger and Cargo Aircraft</td><td>Cargo Aircraft Only</td></tr>
<tr><td>10 Goods Carriage</td><td>11 Place of loading</td></tr>
<tr><td>12 Place of discharge</td><td>13 Destination</td></tr>
<tr><td>14 Shipping Marks</td><td>Number and kind of Packages, Description of Goods</td><td>Gross Mass (kg)</td><td>Net Mass (kg)</td><td>Cube (m^3)</td></tr>
<tr><td colspan="5"></td></tr>
</table>

<table>
<tr><td>15 Container Identification Number / Vehicle Registration no.</td><td>16. Seal Number(s)</td><td>17 Container/Vehicle size and type</td><td>18 Tare Mass (kg)</td><td>19 Total Gross Mass (including tare) (kg)</td></tr>
<tr><td colspan="2">CONTAINER/VEHICLE PACKING CERTIFICATE
I hereby declare that the goods described above have been packed/loaded into the container/vehicle identified above in accordance with the applicable provisions **
MUST BE COMPLETED AND SIGNED FOR ALL CONTAINER/VEHICLE LOADS BY PERSON RESPONSIBLE FOR PACKING / LOADING</td><td colspan="3">21 RECEIVING ORGANISATION RECEIPT
Received the above number of packages/containers/trailers in apparent good order and condition, unless stated hereon:
RECEIVING ORGANISATION REMARKS:</td></tr>
<tr><td colspan="2">20 Name of Company</td><td>Haulier’s Name</td><td colspan="2">22 Name of company (of shipper preparing this note)</td></tr>
<tr><td colspan="2">Name/status of declarant</td><td>Vehicle Registration No.</td><td colspan="2">Name/status of declarant</td></tr>
<tr><td colspan="2">Place and Date</td><td>Signature and Date</td><td colspan="2">Place and date</td></tr>
<tr><td colspan="2">Signature of declarant</td><td>Driver’s Signature</td><td colspan="2">Signature of Declarant</td></tr>
</table>

ANNEX E
(*Foreword*)

COMMITTEE COMPOSITION
Transport Services Sectional Committee, SSD 01

Organization	*Representative(s)*
Indian Institute of Technology Delhi, New Delhi	PROF GEETAM TIWARI (**C*hairperson***)
Agri Value Chain Services Private Limited, Chennai	SHRI R. SIVAKUMAR
Air Passengers Association of India, Chennai	REPRESENTATIVE
All India Transporter's Welfare Association, New Delhi	SHRI PRADEEP SINGAL SHRI MAHENDRA ARYA (*Alternate* I) SHRI J. P. SINGLA (*Alternate* II)
Asian Institute of Transport Development, New Delhi	SHRI RAGHU DAYAL SHRI B. N. PURI (*Alternate*)
Associated Chambers of Commerce and Industry of India, New Delhi	SHRI RAJKIRAN JAYARAM KANAGALA SHRI D. S. RAJORA (*Alternate* I) SHRI KAUSHAL LAL GUPTA (*Alternate* II)
Association of State Road Transport Undertakings, New Delhi	SHRI R. R. K. KISHORE SHRI PRAFUL MATH (*Alternate*)
Bureau of Civil Aviation Security, New Delhi	REPRESENTATIVE
Bus and Car Operators Confederation of India, Chennai	SHRI A. AFZAL
CSIR - Central Road Research Institute, New Delhi	DR ERRAMPALLI MADHU DR MINAL (*Alternate*)
Carrier Transicold India, Mumbai	SHRI PANKAJ MEHTA SHRI AKSHAY M. RAJAN (*Alternate* I) SHRI JOSHUA R. D'SOUZA (*Alternate* II)
Clariant Chemicals India Limited, Mumbai	SHRIMATI TEJESHRI PINGALE
Central Institute of Road Transport, Pune	SHRI K. V. R. K. PRASAD SHRI RAJKUMAR MALAJURE (*Alternate*)
Container Corporation of India, New Delhi	REPRESENTATIVE
Confederation of Indian Industry, New Delhi	SHRI NITIN VYAS SHRI A. M. VISVANATHAN (*Alternate*)
DG Shipping, Mumbai	CAPT RAJENDRA POSWAL
Domestic Air Cargo Agents Association, Navi Mumbai	REPRESENTATIVE
Dredging Corporation of India Limited, Vizag	PROF G. Y. V. VICTOR CAPT S. V. PRASAD (*Alternate* I) SHRI T. V. SURESH KUMAR (*Alternate* II)
Federation of Cold Storage Associations of India, Lucknow	REPRESENTATIVE
Federation of Freight Forwarders' Associations in India, Mumbai	SHRI ALAN JOSE SHRI SHANKAR SHINDE (*Alternate*)
Federation of Indian Chambers of Commerce and Industry, New Delhi	SHRI SACHIN HARITASH

Organization	*Representative(s)*
Hindustan Unilever Limited, Mumbai	SHRI SANJAY HARLAKA
Human Qind Design Foundation, New Delhi	MS RUCHI VARMA
Indian Federation for Road Safety, Hyderabad	SHRI VINOD KUMAR KANUMALA SHRI DHEERENDRA SAMINENI (*Alternate* I) SHRI BODE SAI DEEPAK (*Alternate* II)
Indian Institute of Foreign Trade, New Delhi	PROF NITIN SETH PROF DEEPANKAR SINHA (*Alternate*)
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